FINGER SQUID QUBIT DEVICE

ABSTRACT

A finger SQUID qubit device and method for performing quantum computation with said device is disclosed. A finger SQUID qubit device includes a superconducting loop and one or more superconducting fingers, wherein the fingers extend to the interior of said loop. Each finger has a mesoscopic island at the tip, separated from the rest of the finger by a Josephson junction. A system for performing quantum computation with the finger SQUID qubit device includes a mechanism for initializing, entangling, and reading out the qubits. The mechanism may involve passing a bias current across the leads of the superconducting loop and a mechanism for measuring a potential change across the leads of the superconducting loop. Furthermore, a control system includes a mechanism for addressing specific qubits in a quantum register of finger SQUID devices.